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The Trends in Education Regarding Could Computing Between The Years 2005 and 2013

Fezile Ozdamli[a]*, Damla Karagozlu[a], Ozge Beyatli[a], Kezban Ozansoy[a]

[a]*Department of Computer Education and Instructional Technology, Near East University, Cyprus*

Abstract

The purpose of this study, to analyse studies conducted on "cloud computing" in the field of education and to determine which systems are used in the studies and researchers tendency towards new trends between the years 2005 and 2013. In this study, 56 articles on Cloud Computing in the field of education published between 2005 and 2013 have been examined by scanning databases of Web of Science and Science Direct. Search made on databases have been limited by keywords "Could Computing" and "Education". According to results it can be clearly stated that Cloud computing can be used in all areas of education as a new service model.

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Keywords: Cloud computing; education; content analysis

1. Introduction

Rapid increase in demand information in education has led computer technology to assume an important role in the to take an important role in the field of education (Keser, Uzunboylu and Ozdamli, 2011). Computers can be used for various purposes in education such as school management, counselling services, research, evaluation and teaching. Internet based education applications which combines computer and internet technologies creates constructivist learning, cooperative learning and self-learning environments as individuals who are geographically remote share information and ideas (Keser, Uzunboylu, Ozdamlı, 2011; Ezza, 2014; Jiang, 2014). Nowadays, internet has become an indispensable element of our lives. We can check our emails more than once a day, access to

* Fezile Ozdamli. Tel.:+90 392 22 36 464.
E-mail address: fezile.ozdamli@neu.edu.tr

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social networks and communicate with people in different parts of the country and the world based on our own preferences, manage banking transactions, monitor our children at school or add onto our knowledge via distant learning. In fact, all these are opportunities provided by cloud computing. Putting in the service of institutions more advanced models of these opportunities we use as individuals is the subject of cloud computing model (Tubisad, 2013; Supasorn, 2014).

Cloud computing can be defined as running services and applications of a company or a public institution which are normally run on IT structures owned by the institutions on an external structure such as Internet (Tubisad, 2013; Laribi and Didi, 2014). The necessity to reduce expenses related to IT elements is one of the reasons for transitioning to cloud computing. In general we can identify these elements as hardware, software, network and staff. First of all, budget allocated for hardware will be significantly reduced in all types of services since servers of the third party service providers will be used and hardware allowing only access would be enough (ENISA, 2009). Savings will be made in overhead costs such as server hardware, uninterruptible power supply, cooling system and server software license requirements, annual maintenance costs, additional changes in case of incompatibility in the operations of the new and the old hardware and data storage.

According to an assessment of the Economist, approximately 6% of the available server capacity is thought to be used in institutions (The Economist, 2008). A lot of businesses, educational institutions have begun to use cloud computing for both affordability and convenience.

The purpose of this study, to analyze studies conducted on "cloud computing" in the field of education and to determine which systems are used in the studies and researchers tendency towards new trends between the years 2005 and 2013.

1.1 Cloud Computing

Cloud computing is the obtaining of services by institutions, related to information systems which are used for running businesses from third party providers on the internet. Cloud computing can provide institutions with facilities such as data storage, backup, information processing, application and development (Ozpınar, 2013).

Cloud computing has a structure that enables you to conduct business in a flexible and fast manner by providing you access at any point without being tied to a fixed location, allows you to quickly increase or decrease the scale of the service and provides you with the ability to easily monitor the use, control and reporting of resources.

Besides its positive aspects cloud computing systems have also led to the emergence of some dangers. These dangers include deterioration of integrity of infrastructure, violation of privacy and negative effects on the availability of the system. In 2011, Amazon's Elastic Compute Cloud service was used by cyber pirates in order to gain control of Sony's Online Entertainment system (Patel, Taghavi, Bakhtiyari, Junior, 2013; Mustafina, Kalpeyeva and Mazhenov, 2014).

Cloud Computing services can be divided into three categories. These are infrastructure, platform and software services (Kucuksille et al, 2013). Infrastructure as a Service; Institutions obtain storage device, computer network and server that they need for business from firms that provide these as cloud computing services. Platform as a Service; applications are operated by service providers and they are readily available as services for customers (Explorer, 2013).

2. Methodology

In this study, 56 articles on Cloud Computing in the field of education published between 2005 and 2013 have been examined by scanning databases of Web of Science and Science Direct. Search made on databases have been limited by keywords "Could Computing" and "Education". The criteria considered in the study are year of publication of studies related to cloud computing in education, distribution of articles according to the database, allocation of cloud computing systems by year and proportion of paid and unpaid systems according to years.

3. Results and Comments

The obtained results are reported according to the criteria set out below.

3.1 Year of publication

In Figure 1, the distribution by year of the examined 56 articles related to Cloud Computing are given below.

Figure 1. Distribution of Articles by Year

According to the findings, 11 studies in 2010, 11 studies in 2011, 15 studies in 2012 and 19 studies in 2013 were published. Cloud computing have not been used in the studies on education before 2010 as it were a new technology.

3.2 Article Numbers by Database

In Figure 2, distribution of 56 articles relating to Cloud Computing by Journal.46 articles have been published in Science Direct and 10 articles have been published in Web of Science.

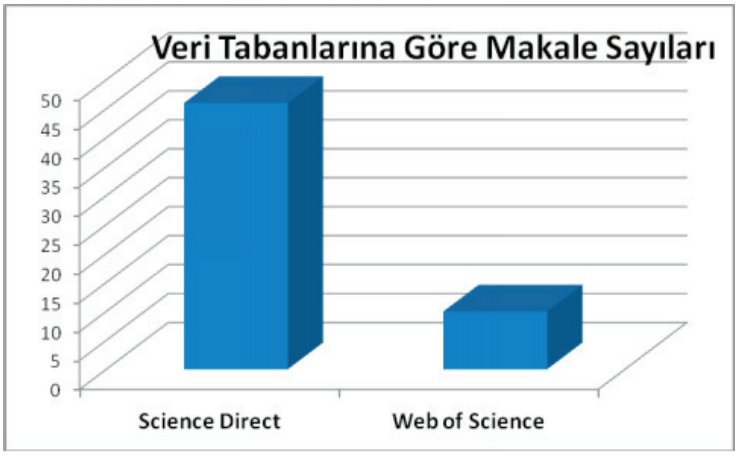

Figure 2.Distribution of Articles by Database

According to the findings, journals in the Science Direct database seem to give more space to this issue. Distribution by the Cloud Computing System used. Table 1 The Cloud Computing systems used in 56 articles examined

Table 1.Breakdown of Cloud Computing Systems used in articles

Cloud Computing Systems	2010	2011	2012	2013	TOTAL
Cloud Sim	0	0	0	1	1
IBM SOA	2	2	4	2	10
Google Apps	4	4	4	5	17
IDPS	0	0	3	1	4
Azure	2	1	2	3	8
Amazon	0	2	2	3	7
Virtual Computing Lab	0	0	0	2	2
Vehicular Cloud Computing	0	0	0	1	1
Other	3	2	0	1	6

Accordingly, in 2010 two studies used IBM SOA study, Google Apps were used in four studies, Azure was used in two studies and other systems were used in three other studies.

In 2011 IBM SOA was used in two studies, Google Apps were used in four studies, Azure in one study, Amazon in two studies and other systems in two other studies were used.

In 2012 IBM SOA was used in four studies, Google Apps were used in four studies, IDPS in three studies, Azure in two studies and Amazon in two studies were used.

In 2013 one study used Cloud Sim, IBM SOA was used in two studies, Google Apps in five studies, IDPS in one study, Azure in three studies, Amazon in three studies, Virtual Computing Lab in two studies, Vehicular Cloud Computing in one study and one study with other systems was conducted. Based on the results Google Apps system is used the most in the field of education.

3.3 Distribution of Paid and Unpaid Systems by Year

In Table 2 distribution of Cloud Computing systems, paid and unpaid, used in 56 articles are shown by year. Accordingly in 2010 five unpaid and six paid systems, in 2011 two unpaid, nine paid systems, in 2012 three unpaid, twelve paid systems and in 2013 six unpaid and thirteen paid systems were used.

Table 2.Distribution of Paid and Unpaid systems used in Articles

Year	Number of Unpaid Online	Number of Paid Online
2010	5	6
2011	2	9
2012	3	12
2013	6	13
TOTAL	16	40

As it can be seen in Table 2 in most studies paid systems are preferred. The reason for this might be the assumption that paid systems are more reliable in terms of security.

4. Conclusion

It can be clearly stated that Cloud computing can be used in all areas of education as a new service model. Convenience provided by cloud computing in education and learning have increased its use. Accordingly, this study conducted puts forward that in the last four years number of studies using cloud computing have steadily increased in the last four years.

Based on the articles examined about Cloud Computing systems it has been identified that paid systems are more preferable. In 2010 number of paid systems preferred is six and number of unpaid systems preferred is five, whereas in 2013 paid systems were used in thirteen studies and only in six studies unpaid systems were preferred. The reason for the number of paid systems to become more than two times of unpaid systems within 3 years can be based on the consideration of unpaid systems being insufficiently reliable for protection and storage of information.

In the studies conducted it can be seen that Google Apps and IBM SOA are the most preferred systems and Cloud Sim and Vehicular Cloud Computing systems are the least preferred systems.

Finally, conducting research on mobile programming and development of mobile technology for education and learning in terms of cloud computing will provide significant benefits to the field of education.

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